Observations on the present epidemic of typhus / by Robert Perry.

With the Author's Compts.

OBSERVATIONS

ON THE

PRESENT EPIDEMIC OF TYPHUS.

BY

ROBERT PERRY, M.D.,

PHYSICIAN TO THE ROYAL INFIRMARY, GLASGOW.

(*Read before the Glasgow Medical Society*, 19*th December*, 1865.)

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FROM the numerous and able works which have been published upon fever, it may be supposed by some medical men that nothing new can be added to our knowledge of the subject. In large cities, however, fever is very rarely, if ever, absent, and consequently is at all times a matter of interest to the medical profession. More especially has such been the case for some time past throughout both England and Scotland, on account of the recent epidemic of typhus which has prevailed for about two years, and which has not yet ceased. Although we are never entirely free from typhus fever in Glasgow, still we have enjoyed an unusual amount of immunity since the last great epidemic of 1847–48; so much so, that many persons were congratulating themselves on the improved state of the city, and thinking that the abundant supply of pure water we now enjoy, together with the increased attention now paid to sanitary measures, and the higher scientific knowledge now brought to bear upon them, had fairly given a check to the periodic outbreaks of typhus, which formerly were wont to return with much virulence, and with considerable regularity, about every third or fourth year.

In November, 1864, I was appointed to the charge of the fever wards in the Glasgow Royal Infirmary. Before that time I acted, during a term of three months, as supernumerary physician, and had a portion of the fever patients under my care. At the end of December I was myself attacked by typhus, and, in consequence, was absent from duty for about two months. I now propose to lay shortly before the society a summary of the results

of my observations during the past year, and I have been induced to make this retrospect for two reasons:—

1st. To preserve a record of those observations which may possibly be of some use to others who have not enjoyed the same privilege as myself of treating large numbers of cases; and 2nd. To endeavour to discover what my own errors and shortcomings may have been, and so to strive to avoid them in future.

Moreover, however feeble the effort may prove, it is always of importance to place on record accurate observations of every epidemic.

The only apology I therefore offer to the society, is for the very imperfect way in which I now submit to the members the following analysis of the cases which have been under my care, together with a few desultory remarks upon the diagnosis and treatment of typhus.

The cases I here mention as typhus fever were all characterized by distinct and decided febrile symptoms, and accompanied by those peculiar maculæ, or the mulberry or rubeoloid rash, which many members of this society may well remember that my father, the late Dr. Perry, often pointed out to them, at a time when the distinction between typhoid fever and typhus was little understood, as the chief symptom which entitled the latter to be ranked as one of the exanthemata. I have no intention of entering at length upon the pathology of typhus, nor upon the question of identity or non-identity of typhus and typhoid fever. I must, however, state briefly that I hold strongly to the opinion that the two forms are quite distinct, and easily distinguishable as a general rule; although cases do occur in which the symptoms of both affections are present at the same time, and I have met with two or three such in my own practice. Typical or well-marked cases of each disease present such decided points of dissimilarity, that it appears to me a matter of surprise how any one who has had the opportunity of observing both on a large scale, can still maintain that they are identical, or that they are only varieties of the same disease.

With no desire to detract from the accuracy of the observations of the late Dr. Joseph Bell, one of my predecessors in the Glasgow Royal Infirmary, or from the subtilty of reasoning displayed in that admirable series of papers published in the *Glasgow Medical Journal* in 1860 and 1861, in which he strives to prove the identity of typhus and typhoid fevers, I must here remark that I have not been able to find in the intestines of patients who have died of undoubted typhus, those pathological conditions of Peyer's glands which he states to be present and identical in both forms of fever. It is true that there is frequently found in typhus a vascularity or congestion of the mucous membrane of the small intestines, and in a somewhat smaller proportion the

mucous membrane of the large intestines is also found in a similar condition. We need not be surprised at this state of the intestinal mucous membrane, nor of the turgid condition of the glands at times seen, as hyperæmia of the various organs seems to be the principal pathological condition of typhus, and there would be matter for surprise were the glands never found in such a state.

When the two kinds of fever have been running their course in the same patient at once, then the lesion of Peyer's glands, peculiar to typhoid fever, might naturally be expected.

Although in the present epidemic neither Peyer's glands nor the solitary glands of the small intestines exhibit after death from typhus those lesions, which are now considered as pathognomonic of typhoid fever, I do not consider, on that account, we are at liberty to call in question the accuracy of those writers who have recorded the fact of similar lesions occurring in former epidemics of typhus.

In the following abstract of the appearances observed by the late Dr. Perry in the post-mortem examination of 430 cases of typhus fever, from 1832 till 1842, it will be noticed that Peyer's glands were found congested and enlarged in 163 cases, and ulcerated in 15; while the solitary glands were found congested and enlarged in 106 cases, and ulcerated in 10.

ABSTRACT OF POST-MORTEM APPEARANCES IN 430 CASES OF TYPHUS FEVER.

HEAD.

	Cases.
Vascularity of scalp,	213
Congestion of membranes,	345
Effusion under membranes,	325
Effusion at base of brain and into spinal canal,	282
Congestion of brain,	323
Brain soft,	15
Brain firm,	6

CHEST.

Pleuritis without effusion,	36
Effusion of coagulable lymph into pleural cavity,	47
Recent adhesions,	40
Old adhesions,	165
Bronchitis,	143
Pneumonia,	69
Œdema of larynx, &c.,	7

HEART.

Coagula in cavities,	217
Blood fluid,	148
Softening and hypertrophy, &c.,	226
Thickening of valves,	4

ABDOMEN.

Peritonitis,	10
Congestion of stomach,	156
Congestion of mucous membrane of small intestines,	229
Perforation,	6
Ulceration of mucous membrane of small intestines,	7
Congestion of mucous membrane of large intestine,	105
Ulceration of mucous membrane of large intestine,	6
Peyer's glands enlarged,	163
" " ulcerated,	15
Solitary glands enlarged,	106
" " ulcerated,	10
Mesenteric glands enlarged,	32
Spleen enlarged,	64
Spleen softened,	270
Kidneys congested,	26
" pale and flabby,	3
Liver congested, soft, &c.,	64
Gall bladder distended and bile thick,	204

Fifty-two cases were inspected by Dr. A. Anderson in the Glasgow Royal Infirmary in 1837–38, and in nearly all of them he found congestion and enlargement of Peyer's and the solitary glands, with five cases of ulceration in Peyer's glands.

I have seen ulceration of Peyer's patches in one case only out of thirty inspections. In one other case I found all the solitary glands of the small intestines enlarged and infiltrated with a soft yellowish white deposit, which upon examination under the microscope was seen to be of homogeneous character, without any trace of structure or cell development. From the fact of the enlargement or ulceration of Peyer's glands being rarely seen now in typhus, I think we may conclude that the type of the disease is not at all times the same. Adopting the views of pyrexia so ably enunciated by Dr. Parkes, of University College, we may suppose that at times the products of increased metamorphosis of the tissues are retained in the blood, and in the cases where congestion and ulceration of the intestines occur, such retained products are thrown upon the mucous membrane of the small intestines, thus producing a local inflammation there.

In the present epidemic, upon the same theory we may say that the retained products of tissue metamorphosis were thrown upon the pulmonary tissue, as congestive pneumonia proved to be the most frequent and most fatal complication. In the same way I might explain the frequent occurrence of congestion and ulceration of the urinary bladder, observed by myself in 1850 in the Glasgow Royal Infirmary, while acting as assistant to the late Dr. Robert Macgregor. I related to the Pathological Society the history of 25 cases, and exhibited some of the recent

specimens, and some casts of the pathological appearances at that time so frequently found in the bladder. The cases were afterwards published by Dr. Macgregor in the *London Medical Gazette*, New Series, vol. i., 1851. Some of the preparations may still be seen in the pathological museum of the hospital.

The total number of patients admitted into the fever wards of the Glasgow Royal Infirmary in 1864 amounted to 2397. The number admitted from the 1st of January, 1865, up till 1st November, 1865, is 2082. The total number of cases which I have had under my charge up till 1st November, 1865, is 1214. Of this number 1096 were cases of typhus, 28 of enteric or typhoid fever, 44 of variola, 25 cases of febricula, 6 of scarlatina, 2 of rubeola, and 13 of pneumonia and other pyrexial affections, which it is needless to individualize, as I intend to confine my remarks at present to typhus exclusively.

The following table will show at a glance the above-noted numbers, with the percentage of mortality:—

Disease.	No. of Cases.	Recoveries.	Deaths.	Mortality per cent.
Typhus,.....	1096	938	158	14·41
Enteric fever,.....	28	25	3	10·7
Variola,.....	44	39	5	11·36
Febricula,.....	25	25	—	—
Scarlatina,.....	6	6	—	—
Rubeola,.....	2	2	—	—
Pneumonia, &c.....	13	13	—	—
Total,.....	1214	1048	166	13·67

Excluding all but the typhus cases, I will briefly analyze the mortality according to the respective ages of the patients.

Of the 1096 cases 158 were fatal, thus giving a mortality of 14·41 per cent; but deducting those patients who were moribund on admission, and several of whom I did not visit even once, or the number of those that died within 48 hours, amounting to 22, the mortality is reduced to 12·66.

		Deaths.	Mortality per cent.
Total No. of cases,.....	1096	158	14·41
Deducting 22 moribund on admission, or who died within forty-eight hours,	1074	136	12·66

TABLE SHOWING THE MORTALITY AT DIFFERENT AGES.

Age.	No. of Cases.	Deaths.	Mortality per cent.
Under 5 years,.....	12	—	—
From 5 to 10 years,.....	83	1	1·2
" 10 " 15 "	150	5	3·33
" 15 " 20 "	255	17	6·2
" 20 " 25 "	192	27	14·06
" 25 " 30 "	116	18	15·51
" 30 " 35 "	79	10	12·65
" 35 " 40 "	82	19	23·17
" 40 " 45 "	51	20	39·21
" 45 " 50 "	26	15	57·96
" 50 " 55 "	16	7	43·75
" 55 " 60 "	15	9	60·
" 60 " 65 "	8	3	37·5
" 65 " 70 " and above	8	5	62·5
Age not known,.....	3	2	66·66
Total,.....	1096	158	14·41

Of these deaths a considerable number was attributable rather to some attendant complication than to the typhus fever alone.

The one death which occurred below 10 years was in the case of H. C., aged six years, a weakly scrofulous-looking girl, who evidently was labouring under tabes mesenterica, as shown by the emaciated state of the body on admission, together with the tumid condition of the abdomen and the diarrhœa. She died upon the 13th day of her illness, but I was not permitted to verify my diagnosis by a post-mortem examination.

The deaths between 10 and 15 years of age were 5 in number.

The first of those was J. G., female, aged 14, admitted into Ward 19, after having been ill for 7 days. Typhus rash rather indistinct and interspersed with a very large number of flea-bites. Pulse 132. Tongue white and moist. Although she appeared a delicate weakly girl there were no symptoms present to lead me to anticipate the fatal result which so soon ensued. On the third night after admission she was suddenly seized while in bed with a vomiting of blood, which amounted in quantity to about sixteen or eighteen ounces, and shortly afterwards she also passed a considerable quantity by stool. Gallic acid was freely administered, and small but frequently-repeated quantities of brandy. She rapidly sank, however, and died within twelve hours after the first attack of hæmatemesis. No inspection of the body was obtained.

The next case is that of J. M., carter, aged 14, admitted into Ward 14 on 25th April. There was the history of typhus from contagion of eight days' duration before admission. Very distinct typhus rash. Tongue white and moist. Pulse 120, of moderate

strength. Bowels confined. There was very decided opisthotonos, so that the boy was unable to sit up in bed, and when assistance was given to raise him, the whole body was found to be rigid and curved backwards to a slight extent. The left foot was swollen and œdematous, and the œdema extended in a less degree over the whole leg and thigh, with some hardness, and a degree of tenderness upon pressure in the course of the femoral vein. On the dorsum of the foot an erysipelatous redness was observed, which extended upwards to about the ankle. The patient was quite sensible, did not complain of much pain anywhere, and took food with avidity. A purge of calomel and rhubarb was given, and sinapisms were applied to the nape of the neck and in the course of the spinal column. The foot was poulticed for two days, when a small abscess was opened, and exit given to a little pus, after which the poultices were changed for water dressing and the whole limb bandaged. The opisthotonos gradually passed off. The swelling of the thigh, however, increased, and extended upwards to the abdomen, evidently in the course of the iliac veins. No decided fluctuation could be made out in the thigh, and the abdominal swelling increased very much up till the time of the boy's death. Wine, brandy, and beef tea were freely administered, and greedily taken till shortly before death, the patient continuing sensible all the time, with the exception of slight fits of raving on awaking from sleep during the night. On the 16th day of his illness this patient died.

On post-mortem examination, a large quantity of very offensive and grumous pus was found burrowing deeply amongst the muscles of the thigh, and extending in the line of the iliac vessels through the pelvis, and into the lumbar region behind the peritoneum. I had not time to make a particular examination of the body personally; and the stench from the purulent matter was so intolerably offensive, that the pathologist and his assistants were very glad to have the body removed as speedily as possible, without making any more detailed inspection of the case. Dr. Gairdner, in his communication upon fever in the *Glasgow Medical Journal*, No. 48, January, 1865, gives the history of one fatal case of typhus, with secondary inflammation of the femoral vein. I have met with a considerable number of cases in which phlegmasia dolens, or white leg, occurred during convalescence from typhus, and in three or four of them, at least, the femoral vein was felt like a hard cord, and was very tender and painful upon pressure. I have also had one death from general pyæmia, with the formation of numerous abscesses in various parts of the body. There appears to be little doubt that, in the case just mentioned, the abscess on the dorsum of the foot was the exciting cause of the phlegmasia

and secondary purulent effusion amongst the femoral and lumbar muscles and fasciæ.

Dr. Murchison states, that out of nearly 700 cases of typhus which came under his care in 1862, not a single instance of phlegmasia dolens occurred. He, however, relates the history of a fatal case, admitted into the London Fever Hospital in 1857, where at the autopsy no clot was found in the femoral vein, but merely the swelling of the left leg, a fatty heart, and acute atrophy of the liver.

The third death, in a patient under 15 years of age, occurred in the case of J. D., a boy aged 12, admitted on September 12 along with his father, who also had typhus, with a copious eruption. The boy was admitted on the third day of the fever. The typhus rash appeared between the 4th and 5th days. Symptoms of acute pneumonia set in upon the 9th day, and the case terminated fatally on the 16th day, with all the usual signs of gangrene of the lungs. The horribly fœtid odour emitted by the breath, and the pinched and anxious expression of the countenance, together with the physical signs on percussion and auscultation, left no doubt on my mind as to the nature of the case, although I was not permitted to verify my diagnosis by an autopsy. A liberal supply of stimulants and nourishment, quinine, nitro-muriatic acid, inhalations of chlorine, and chlorinated washes, are recommended for such cases. Quinine and acid, with stimulants, and as much nourishment as could be taken, were given in this case, but proved as futile as such remedies usually do in similar cases.

The fourth death, under 15 years of age, occurred in the case of a girl, on the 11th day of the fever, and within 48 hours after admission.

The fifth in the case of a girl 14 years of age, on the 16th day of her illness, and apparently from uncomplicated typhus.

The total number of cases in patients of 15 years of age and under was 245, with 6 deaths—2·44 per cent., or, in round numbers, with a mortality of less than $2\frac{1}{2}$ per cent.; and by deducting those cases in which death was clearly attributable to the complication or secondary affection, the mortality would only be 1·18, or less than $1\frac{1}{4}$ per cent.

In Dr. Murchison's statistics of cases admitted into the London Fever Hospital during ten years, there are 563 cases of 15 years of age and under, with a mortality of 35, or rather above 6 per cent.

Did time permit, I might analyze in a similar manner the remainder of the deaths above fifteen years of age; but as I am aware how difficult it is to follow the details of figures, I will merely say that there occurred as complications or secondary affections—

5 cases of pneumonia.
1 case of pleuritis.
1 " pleuro-pneumonia.
1 " meningitis.
1 " erysipelas and hæmaturia.
4 cases of jaundice.
1 case of valvular heart disease, with dropsy.
2 cases of gangrene of lower extremities.

The gangrene of both cases occurred during convalescence, after the patients had been out of bed for two or three days.

The first was that of a female, aged 19, in whom the gangrene extended above the knee. After the line of demarcation was fully formed, and the dead part began to be thrown off, amputation of the thigh was performed. She survived the operation for about ten days; and before death an appearance of gangrene of the other leg had commenced.

The other case was that of a man, aged 45 years, who was almost convalescent when admitted, and who, after he had been sitting up for two or three days, was suddenly seized with pain and coldness of the right leg, which, notwithstanding all the means tried to prevent it, passed into gangrene. When the line of demarcation was formed, amputation of the thigh was likewise had recourse to in this case. He appeared to progress very favourably for about ten days after, when he was seized with a rigor, and died very suddenly.

In the majority of typhus cases, more especially in epidemic seasons, the diagnosis presents no difficulty. On the other hand, however, there are cases in which the difficulty is considerable before the appearance of the eruption, or where it is not well marked, or, it may happen, altogether absent; and in such cases the most material assistance to the diagnosis is rendered by observations of the temperature of the body.

The pyrexial symptoms present in typhus form more or less a part of many other diseases. For example, we have a hot skin, a quick pulse, excessive thirst, scanty and high-coloured urine, &c., in typhoid fever, measles, scarlatina, small-pox, pneumonia, meningitis, nephritis, and other inflammatory diseases. Repeated observations have shown that the range of temperature throughout the progress of many of those diseases, is almost sufficient to point out the particular disease, even although its other symptoms be somewhat obscure or ill-defined.

We are principally indebted to Professor Wunderlich, of Vienna, for introducing to the notice of the profession this method of investigating disease; and Dr. William Aitken, formerly demonstrator of anatomy in the University of Glasgow, now professor

of pathology in the Army Medical School, in his admirable work on "The Science and Practice of Medicine," gives a very excellent statement, compiled from the writings of Wunderlich, "of the chief practical points to be attended to" in studying the variations of the bodily temperature in fever, together with "practical rules as a guide to the regularly continuous determination of the temperature of the body in diseases where fever may be present."

The normal temperature of the body, taken in the axilla or other unexposed parts of the surface in a healthy man, amounts to 98·4° Fahr., with a variation of one or two tenths more or less; and in all climates, whether he be in motion or at rest, the temperature of a healthy man's body rarely varies more than half a degree.

If the temperature fall below 97·3°, then some disease is indicated, as may be instanced in the case of diabetes mellitus; and there can be no fever without, at the same time, an increase of temperature.

Dr. Aitken, in the work just referred to, states that the temperature in typhus ranges from 102° to 107° Fahr. My observations and records of temperature in this epidemic, show that it must be a rare occurrence for the temperature to rise above 106° Fahr. in adults, although in severe cases in children it is not very unusual for it to reach 107°, or even a little higher, from the 5th to the 9th day of the fever. In two of my patients it was as high as 107·2° Fahr.

He also states that, "both in mild and in severe cases, the temperature always rises above 104·7°, and it frequently reaches 106° Fahr. or more."

Dr. G. A. Kennedy, in his medical report of the Cork Street Fever Hospital, Dublin, for two years, from 1837 to 1839, gives the subjoined table of the temperature, as ascertained by himself in 325 cases of typhus, from which it will be seen that in only seven of that number did the temperature reach 105°, and all of those seven were under 25 years of age:—

TEMPERATURE AS ASCERTAINED IN 325 CASES.

93°	94°	96°	97°	98°	99°	100°	101°	102°	103°	104°	105°
1	2	11	5	30	6	71	60	53	40	39	7

In his patients only one observation was made upon each individual, except in a few cases, and the thermometer was placed in the mouth under the tongue.

I have notes of cases of typhus with well-marked eruptions, in which the temperature never, on any day during the whole course of the fever, exceeded 102·7° Fahr.

In the diagram given by Dr. Aitken (page 431, 2nd edition) as a typical one of the range of temperature in a case of typhus fever, he notes the morning temperature as fully one degree higher than the evening temperature, up till the 9th day of the fever, when the evening temperature begins to exceed that of the morning, and continues to do so till the normal temperature of convalescence is arrived at.* In none of my cases in the Royal Infirmary have I observed the same course, but on the contrary, the evening temperature almost invariably exceeds that observed in the morning by about an average of one degree. Occasionally there is no rise, and in some cases I have noted a rise of four degrees. Few of the cases admitted into the fever wards are sent before the 5th or 6th day of the disease, and on that account most of the observations may be considered as somewhat incomplete. The following diagram may be taken as a good specimen of the range of temperature throughout an uncomplicated case of typhus. B. M'D., aged 18, Ward 19. (*See Diagram annexed.*)

In the case of B. M'D., as no medicinal treatment was required, as no stimulants were administered, and as the patient was a robust and otherwise healthy female, the range of temperature may be taken as typical of typhus fever, without complication, and terminating favourably; and throughout the progress of the fever, it will be seen, by looking at the diagram, that the temperature was always from one to two degrees higher in the evening than in the morning, except on the 10th day, in the evening of which it fell four-tenths below the morning temperature, probably in consequence of a free evacuation of the bowels. In this case, however, there was no corresponding fall of the pulse, which kept at 120, the same as in the morning.

I give also the daily observations of the temperature in the following case, as showing that it is not correct to say that "both in mild and in severe cases the temperature always rises above 104·7° Fahr."

J. M'G., aged 15, admitted October 20th, into Ward 21, on the 5th day of the fever, with a copious dark eruption. This patient was also treated without any medicine or stimulants. On the 14th day, when the patient was apparently beginning to convalesce, she had an attack of diarrhœa, which continued for about three days, and at the same time a few rose papules appeared, exactly similar to those seen in cases of enteric fever, and following the same course.

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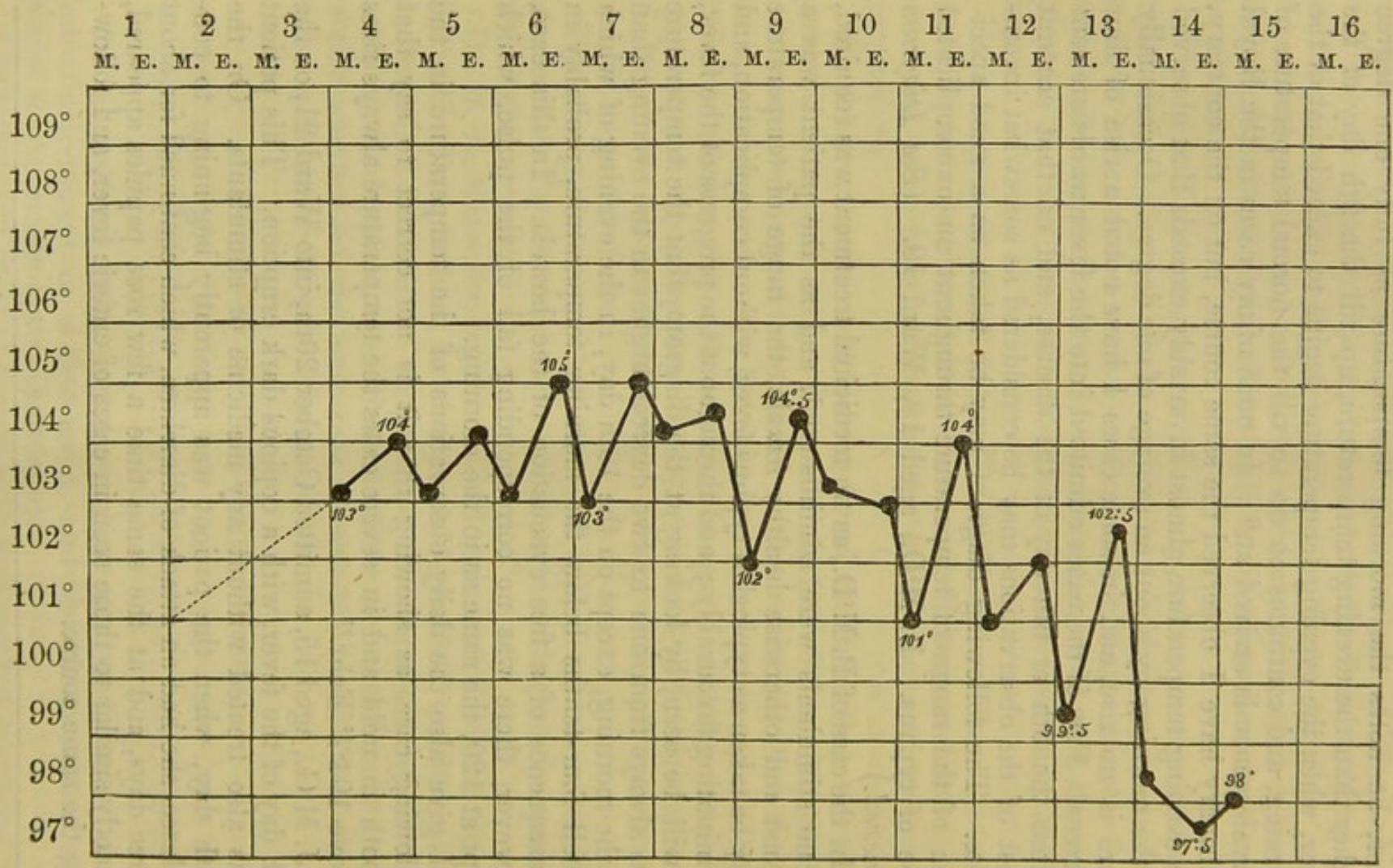
* Since the above was written a fourth edition of Dr. Aitken's work has been published, in which this error is corrected and another diagram given.—R. P.



Normal line of temperature, 98·2° Fahr.

Day of Fever.	Temperature. M.	Temperature. E.	Pulse. M.	Pulse. E.
5	—	100°	—	104
6	99°	101·5°	120	120
7	102°	102·7°	120	120
8	100°	102°	96	108
9	100·5°	102·3°	120	106
10	100·5°	101°	96	120
11	100°	102°	84	96
12	100·2°	102°	90	96
13	99·7°	102°	96	98
14	99·5°	102·5°	88	96
15	99°	100°	84	100
16	100·5°	100°	96	—
17	100°	102°	98	—
18	98°	—	96	—
19	98°	—	78	—

I mention the next case as an instance of the value of the determination of the actual temperature in the diagnosis of doubtful cases.

M. F., aged 17, Ward 21, October, 1865. Sent in on medical certificate as a case of fever. Eight days ago had a rigor, nausea, and other pyrexial symptoms. On admission, complains of much debility, headache, and pains all over the body. The face is flushed, tongue slightly furred. Pulse 96. A very large number of dark bluish purple spots are seen over the whole surface of the body, and more especially over the chest and abdomen. I recollect of only one other instance in which those "tâches bleuâtres," as they are styled by French writers, were so numerous as in this patient. It was in the hospital of La Pitié in Paris, under the care of M. Becquerel, and was designated by him as a case of putrid fever. In this instance the spots were in such numbers, that a person not much accustomed to see the true typhus eruption, might very easily be led to make a mistake. On determining, however, that the temperature was only 98° Fahr., the point was at once decided against this being a case of typhus, as in typhus at the 8th day the temperature is never normal. In four days after the patient felt so well as to desire to be dismissed. Those "tâches bleuâtres" are seen most frequently in patients suffering from enteric fever, but are also met with in other diseases.

Or to take, as another illustration, the case of Mrs. S., aged 29, who had been exposed to the contagion of typhus, being one of the hospital nurses who had never had the disease, and had been complaining of general malaise and symptoms of pyrexia for eight days, during which time she had been confined to bed. On being sent into a fever ward, I found that she suffered from pains and uneasiness all over the body, but more particularly on

left side of chest, and in left axilla. The face was flushed; the tongue brown and dry. Bowels confined. Pulse 96. There was a large quantity of freckles over the whole skin, and in addition to this, a degree of mottling and numerous flea-bites; so that this suspicious appearance of the skin, taken in connection with the other feverish symptoms, had caused her to be sent to my wards as a case of typhus. On careful inspection, however, no true typhus eruption could be discovered, and on taking the temperature, which was found to be 99°, and on the succeeding day 98°, it was at once evident that she was not suffering from typhus.

The pain increased under the left axilla and pectoral muscles, and ultimately an abscess formed there.

Cases of pneumonia are likewise very frequently sent in as cases of typhus, and in them, one or two observations of the temperature generally suffices to determine the existence of simple pneumonia without typhus, the temperature in pneumonia being rarely as high as 104°, which is almost invariably the case when there is typhus with pneumonia as a complication. Wunderlich, however, has observed that the temperature in simple pneumonia rises gradually till the evening of the fourth day, when it reaches its maximum, and rapidly declines till the 9th day, except when some fresh inflammatory action occurs.

Amongst the instances in which one observation may suffice to establish a certain diagnosis, Dr. Aitken says (vol. i. p. 48), "a patient under 18 years of age shows the general symptoms of typhus fever. One evening during the second half of the first week of illness, or during the first half of the second week, the temperature of his body sinks below 103·3° Fahr., without any external cause—a certain indication that the fever is not typhus." My own observations lead me to a somewhat different conclusion, since I have repeatedly seen, in undoubted cases of typhus, a much lower temperature at the stage of the disease referred to; and still further, that a patient may pass through an attack of genuine typhus without at any stage of it having the temperature of his body as high as 103·3° Fahr. In proof of this statement, I have the notes of numerous cases, but will merely again refer to that already given of J. M'G., aged 15.

The typical range of temperature in enteric fever is so distinct from that observed in typhus, that it now furnishes one of the strongest proofs against the identity of the two fevers.

I may here observe, that although the thermometer is beyond doubt a most valuable addition to our other means of diagnosis, as well as a guide of great delicacy and precision, and as such more worthy of reliance than the state of the pulse, I fear, that however general its employment may become in hospitals, and as a means

of clinical teaching, it will not readily find acceptance with the majority of busy practitioners, until at least a new generation of medical men has been educated to its use. The pulse is still likely to be taken as the chief index to the prognosis and treatment of fever. My best thanks are due to my assistants, Messrs. Davidson and Coverly, without whose valuable aid it would have been almost impossible for me to carry out the numerous daily observations on the temperature which I have been enabled to make.

With proper precautions to avoid being misled by the great variety of accidental or concomitant circumstances which may affect both its rapidity and character, observation of the pulse may be said to furnish the next most reliable data for the prognosis and treatment of fever.

The normal temperature in a healthy person never varies more than from half a degree to about one degree; but we all know what an endless variety there is in the rate of the pulse in different individuals. I have repeatedly seen the pulse, especially in females, keep up to 120, and sometimes higher, for more than a fortnight after convalescence from fever, while the temperature remained steadily at 98°.

From an extended series of observations on the pulse, made daily, and regularly noted at the bedside, I am able to corroborate, to a great extent, the deduction arrived at by Dr. Gairdner respecting the prognosis and treatment, as judged of by the rate of the pulse.

In nearly all the milder and uncomplicated cases, the maximum rate has been reached before the 8th day. It is a rare occurrence, however, for the maximum rate to end so early as the 8th day. It more commonly continues for two or three days, at least, at the same rate, and then gradually declines again, until it reaches its normal healthy condition.

In the large majority of cases terminating favourably during the present epidemic, the maximum rate ended on the 10th, 11th, or 12th day, and there was a gradual fall from that day till convalescence.

In a large number of the more severe cases of typhus, the pulse keeps up very high until the 13th or 14th day of the fever, and then, if the disease is going to terminate favourably, there is a sudden and marked fall, say from 120 to 96, or from 100 to 84, thus indicating a decided crisis, and thence a gradual declension, till the pulse of health is reached.

When the case is complicated with some other affection, such as pleurisy, pneumonia, or hypostatic consolidation of the lungs, the rate of the pulse undergoes little or no diminution, but is frequently increased, and becomes weak and irregular; and although the primary fever has ceased, there is no regular crisis,

the illness being prolonged to an indefinite length, till the secondary disease has been recovered from, or till the patient sinks under it.

In a third class of uncomplicated cases, the fever runs on till the 18th or 21st day, the pulse keeping high all the time, then either suddenly falling, or very gradually declining, during a somewhat more tedious convalescence than is usually seen after the fever of shorter duration. The crisis in the present epidemic, or where there is no marked crisis, the subsidence of the fever, as judged of by the fall of the pulse and the diminution of the other febrile symptoms, has usually been observed at an earlier day in the course of the disease, than was noted in the last great epidemic of 1847–48. The duration of the fever in that epidemic, was on the average 14 days. In the present epidemic it is frequently only 13 days, and in children not above 12 days, as an average. In 1850, while I acted as assistant to the late Dr. Robert Macgregor in the Glasgow Royal Infirmary, the convalescence was rarely established before the 14th day, except in young patients and in very mild cases. This fact I do not state from memory merely, but from daily observations made on a considerable number of cases, the notes of which I still have beside me.

With respect to the treatment of typhus fever, it is a trite remark, that after it is once fairly established no man can cure it. All we have to do is to guide our patient through it, treating symptoms and complications as they occur. During the earlier part of this epidemic, from the want of adequate hospital accommodation in the city, the managers of the Royal Infirmary showed an anxiety to provide room for as many patients as possible, and the consequence was that, until the city authorities erected a temporary hospital, the wards of the Royal Infirmary were very much overcrowded.

At present, when all the beds in a ward are occupied, an average of 926 cubic feet of space is allowed to each patient. Before the erection of the temporary fever hospital, and when the wards of the Royal Infirmary were crowded, there was only a space for each of about 700 cubic feet; and in some of the temporary wards then opened, the cubic space was very much less than this.

In those smaller and temporary wards the mortality was much higher than in the regular and more spacious ones. It is proper, however, to mention, that the higher rate of mortality in the smaller wards was not altogether attributable to the smaller amount of space, but in a great measure to the fact of many of the most severe cases being sent into them, as those wards were nearest to the reception room; and patients who were in a state of

great prostration, or occasionally moribund on admission, were thus saved from the extra fatigue of being carried up stairs.

Dr. Murchison, in his treatise on continued fevers (p. 247), states that "500 cubic feet of space, with 2 cubic feet of ventilation per minute, constitute the smallest amount that can be safely allotted to each person. In workhouses the amount of space enforced by the Poor Law Board is 300 cubic feet for a sick ward, or for a dormitory occupied by night only; and 500 cubic feet in a ward occupied by day and night." And again, "In hospitals where typhus patients are admitted, there ought to be an allowance of at least 1500 cubic feet to each bed." Although under the present arrangement there is nominally only an average of 926 cubic feet of space for each fever patient in the Glasgow Royal Infirmary, there is in reality a considerably greater space, as it is not a very common occurrence for all the beds to be occupied at one time in a ward, and there is now no reasonable ground of complaint respecting the accommodation.

In a large majority of the cases, the treatment adopted was of the simplest description, and may be said, in a few words, to consist of a supporting diet, with good nursing, and constant and careful watching against the supervention of any complications or untoward symptoms—meeting such complications or symptoms, as they arose, with the treatment deemed most suitable to each individual case.

In order to give a fair trial to the acid treatment, so highly recommended by Dr. Murchison and others, I prescribed the nitro-muriatic acid in a considerable number of cases. The theory upon which the use of the mineral acids has been so strongly advocated, appears to be beautifully simple, viz., to neutralize the poison of typhus, which is supposed to be present in the blood as a peculiar compound of ammonia; since not only is there an increased quantity of ammonia exhaled by the lungs and the skin, but also the urine and the discharges from the bowels become highly ammoniacal.

In the cases so treated, I must confess that I have not met with that very marked amelioration of the disease which many of the writers on fever have ascribed to the administration of mineral acids; and in not a few instances, when given in the proportions prescribed by Dr. Murchison—viz., 20 minims of dilute hydrochloric acid, and 10 minims of dilute nitric acid, every third hour—I have frequently been obliged to discontinue their administration on account of severe griping and diarrhœa.

When the acids are cautiously administered in rather smaller doses, in conjunction with a few minims of solution of muriate of morphia if the bowels be irritable, sweetened with syrup of orange peel, and diluted with water, the draught so formed is generally

relished by the patient, and often produces a noticeable effect upon the fever—the most marked improvement being seen upon the tongue, which becomes moist and clean, from being very dry and hard, and covered with a brown fur.

In a few cases I gave small doses of permanganate of potash, in order to ascertain if it exercised any antiseptic influence upon the typhus poison. In two of the cases with a very dark petechial rash, it seemed to hasten the disappearance of the eruption. The tongue also began to get clean and moist at an early stage; but as it produced no apparent diminution of the temperature nor of the pulse, and did not shorten the duration of the fever, and as no good results were observed to arise from its administration in the remainder of the cases, I was not encouraged to give it any further trial.

In No. 51 of the *Glasgow Medical Journal*, October, 1865, there is a communication by Dr. De 'Ricci, of Dublin, in which he advocates the use of sulphites and hyposulphites in the treatment of zymotic diseases. "Physiology," he says, "leads to believe that all zymotic diseases depend on a fermenting or catalytic principle in the blood. Chemistry teaches us that in the presence of sulphurous acid and the sulphites no catalytic action can take place, and practical experience confirms the teachings of science, by showing us palpably that zymotic diseases, even in their most virulent forms, become completely neutralized by this remedy." This discovery he ascribes to Professor Giovanni Polli, of Milan. I may here remark, that it is much to be regretted that medical men are so frequently in the habit of making such unqualified assertions respecting the use of various remedies. One might suppose that with such a remedy in hand the treatment of fever would become a very simple matter indeed—neutralize the poison, and, as a natural consequence, the fever must cease.

Being satisfied that the bisulphite of soda—the preparation chiefly recommended—is, at all events, innocuous, I determined to test its efficacy in typhus. After carefully watching the progress of at least a dozen cases in which scruple doses of the bisulphite of soda were administered every three or four hours, I am led to the conclusion, that in typhus fever, at least, no amelioration of the disease is produced by it; as to its action in scarlatina, smallpox, and puerperal fevers, for which it is so highly lauded in the paper just referred to, I am not prepared to speak, having had no experience of it in such cases. Had I been so rash as to have given an opinion upon the use of the sulphites without giving them a full trial, I might have fallen into the mistake of supposing them capable of completely neutralizing the poison of typhus, because in one of the first patients who got

this treatment, there was a very remarkable fall of the pulse, accompanied with an unusual defervescence or diminution of temperature on the 8th day of the fever—the pulse coming down from 120 on the 7th day to 96 on the 8th, and the temperature at the same time falling from 102·8° to 101°. On the 10th day both pulse and temperature were normal, the former being 74, and the latter 98·2°. Although, on admission, this appeared to be a very severe case of typhus, with dark and copious eruption, still I am not inclined to attribute the unusually early termination to the effects of the bisulphite of soda, but rather to a peculiarity in the constitution of the patient, as I found that after his complete recovery he had a remarkably slow and calm pulse. I was the more confirmed in this view from the fact, that in the adjoining bed to this case was a man whom I had dismissed about three weeks before, after recovery from pneumonia. During the time he was under treatment for pneumonia, it was observed that he had a very slow pulse, which never rose on any day above 72, whilst the temperature was 100°. He returned with a distinct typhus rash, and other symptoms of pyrexia; and although he had nothing but dietetic treatment, his pulse never rose above 90, and on the 11th day of the fever was only 72. It afterwards fell as low as 48, but the patient by this time felt so well as to wish to be dismissed. In none of the other cases did I observe the smallest degree of benefit from the use of the bisulphite of soda; all I can say is, that while it does not appear in the slightest degree hurtful, it is by no means an agreeable medicine to the poor patient.

The only other point, with respect to the treatment of typhus, upon which I wish to make a few remarks, is the administration of alcoholic stimulants, a subject which has of late been exciting a considerable degree of interest amongst the profession, chiefly owing to the "Facts and Conclusions as to the use of Alcoholic Stimulants in Typhus Fever," embodied in a paper read to the Medical Society of Glasgow, 5th January, 1864, by Dr. Gairdner, and to some remarks upon the same subject, and by the same author, published in the *Lancet*, January 21, 1865. Several other communications from Ireland and elsewhere appeared about the same time in the public medical journals, in which the writers described the successful treatment of such and such a number of typhus cases without stimulants, indicating that such a line of treatment must be considered somewhat rare or novel.

I have never been in the habit of administering alcoholic stimulants in typhus in the nature of a routine, nor have I been at all guided in my use of them by the age of the patient, but in every instance I judge each individual case according to its own requirements, administering or withholding wine or spirits quite

irrespective of the age of the patient, as the particular case requires the stimulant or does not. Practically, however, the conclusions at which I have arrived, from a retrospective review of my cases, are almost identical with those so forcibly and clearly enunciated by Dr. Gairdner.

Owing to the circumstance of a journal of one of the wards having lately gone amissing, which contains the details of a few of the cases, it is not in my power, without an amount of research for which I have not leisure at present, to classify the whole of my cases according as they have been treated with or without alcoholic stimulants. I have, however, ascertained that 534 cases were treated with wine or spirits during some part of their illness, and out of this number 138 died. On the other hand, 491 were treated without any alcoholic stimulants, with only 9 deaths.

From the much higher rate of mortality amongst the former than amongst the latter, I would caution any one against drawing the conclusion, that the greater relative number of deaths was at all influenced by the administration of the stimulants. All the inference that I think may be deduced from those numbers is, that a large proportion, say fully one-half, of the cases of typhus in the present epidemic, may be advantageously treated without any alcoholic stimulants.

Doubtless a considerable number of those who got wine or spirits would have recovered without a drop of either, but I am satisfied that, in many of them, the risk of a fatal issue would have been much increased, and the patients would have had a much more tedious convalescence.

Of 245 patients below 15 years of age, only 29 had any alcoholic stimulants, and several even of that small number had only very small quantities, and for only a few days.

The state of the cardiac and radial pulses, as pointed out by Dr. Stokes, is the best guide for the administration of alcohol; and, as I before mentioned, the time for giving and the quantity required must be regulated by it in each individual case.

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